

Abstract of the Disclosure

The present invention provides a method for forming a metal silicide layer in an active area of the semiconductor device. The method for forming the metal silicide layer includes: forming a source/drain junction area on a silicon substrate; forming an attack protection layer on the source/drain junction area, wherein the attack protection layer is electrically conductive and prevents a silicon substrate attack caused by chlorine (Cl) gas; forming a titanium (Ti) layer over the attack protection layer through a low pressure chemical vapor deposition (LPCVD) process using a source gas of $TiCl_4$; and diffusing the Ti layer into the attack protection layer to thereby form a metal silicide layer.